Figure 1

32   34

5 ↗   N-   3

N+   2

Figure 2a

32   34   38   36   ↙ 40

5 ↗   N-   3

N+   2

Figure 2b

32   34   38   36   ⤶ 42

5 ↗   N-   3

N+   2

Figure 2c

32   36

42

12

5

N-   4

N+   2   10

Figure 2d

32   36

42

12

5

44

4

N+   2

Figure 2e

48 48

46 46 46

12 32 36 44

4

N+ 2

Figure 2f

46 46 46

14 12 14 12

N-

44

4

N+ 2

Figure 2g

36   36   36   36   36

32   12   32

N-

32   32

N+

12

32

44

4

2

Figure 2h

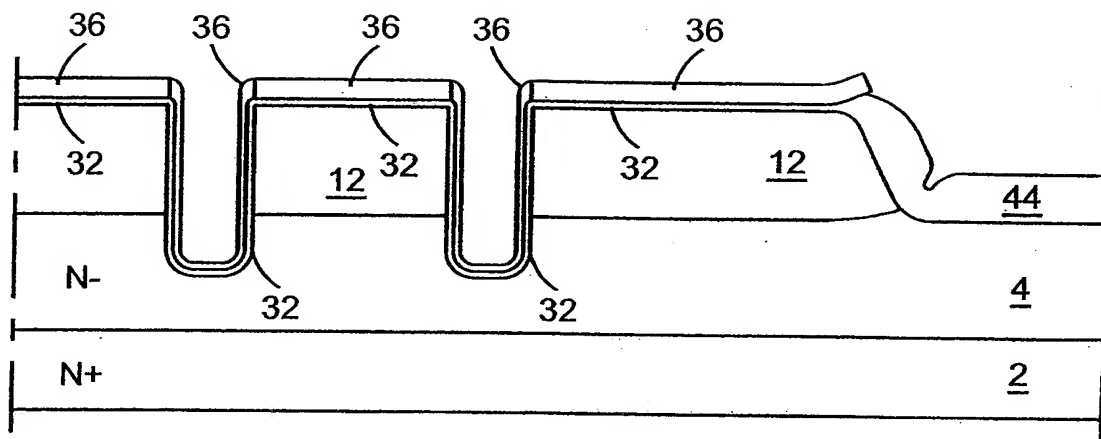36   36   36   36

32   12   32   32

N-

15   15

12

44

4

2

Figure 2i

Figure 2j

Figure 2k

36   36   36   50

32   14   16   18   14   16   18   12   44

N-   15   15   4

N+   2

Figure 2l

36   22   36   22   36   50

32   12   16   18   32   16   18   12   44

N-   15   15   4

N+   2

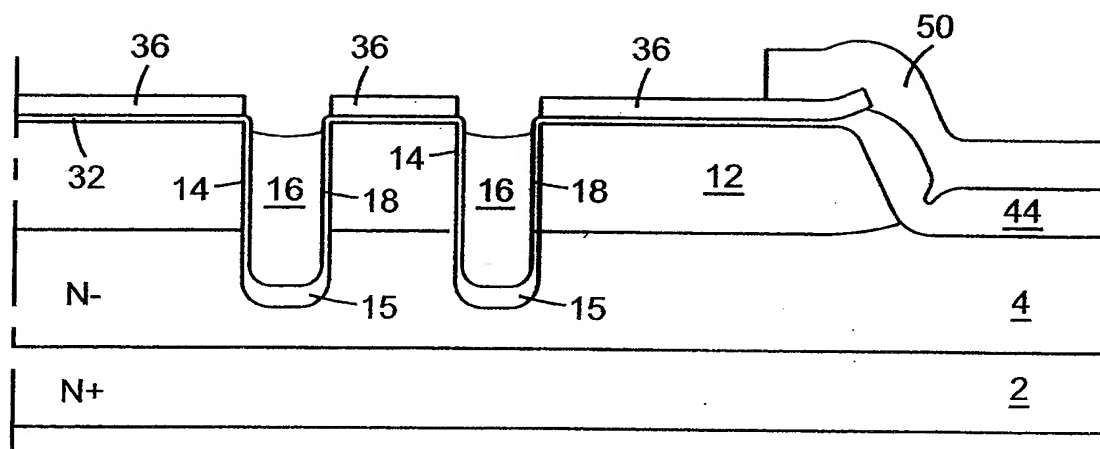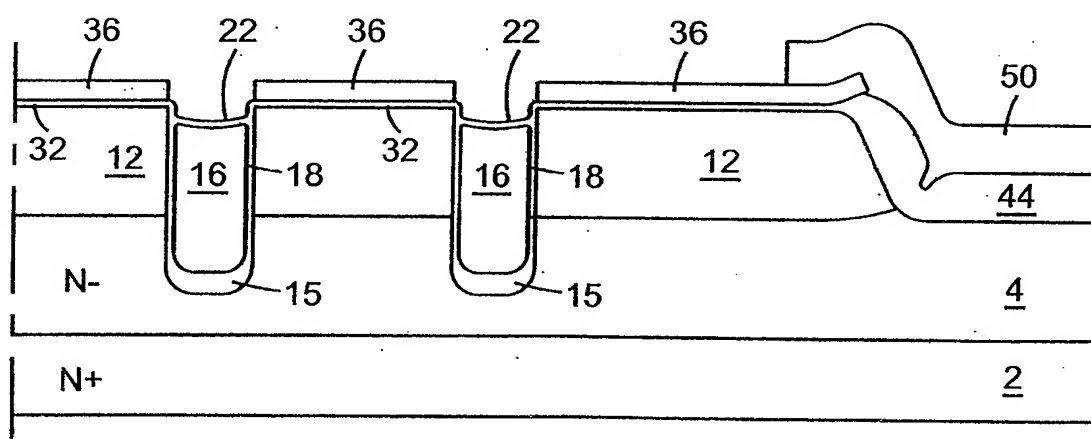## Figure 2m

Figure 2n

Figure 2o

24 32   22   32   22   54   36

54   50

16   18 54   16   18   12   44

N-   15   15   4

N+   2

Figure 2p

58   58   58

56   56

24 32   56

54   36

22   24

54   54   50

18   16   54   16   54   44

N-   15   15   4

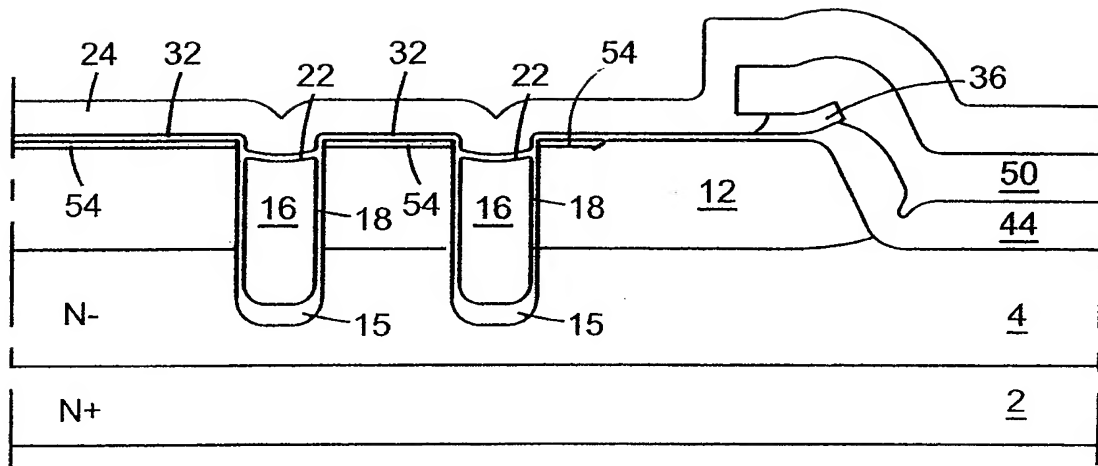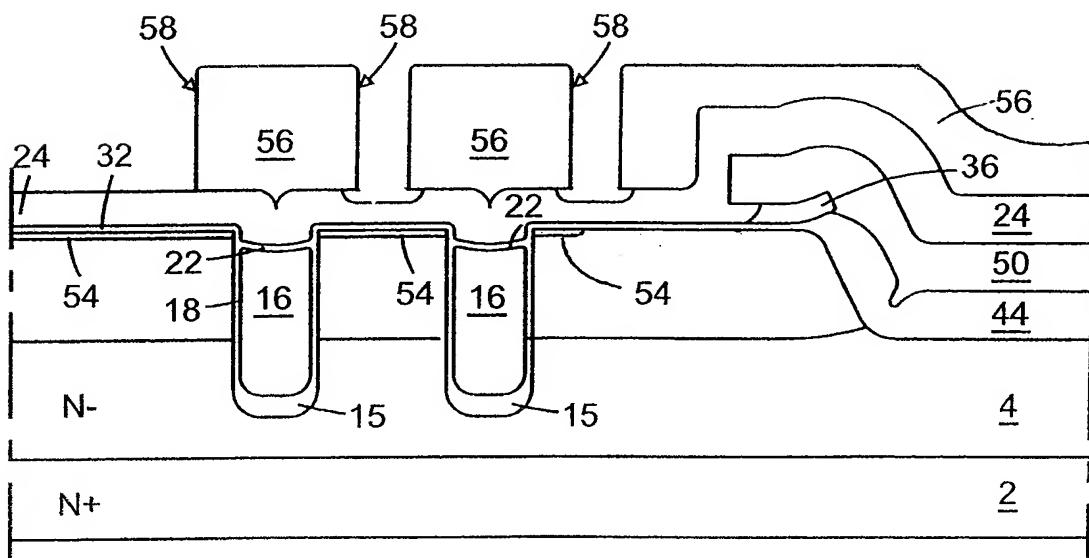N+   2
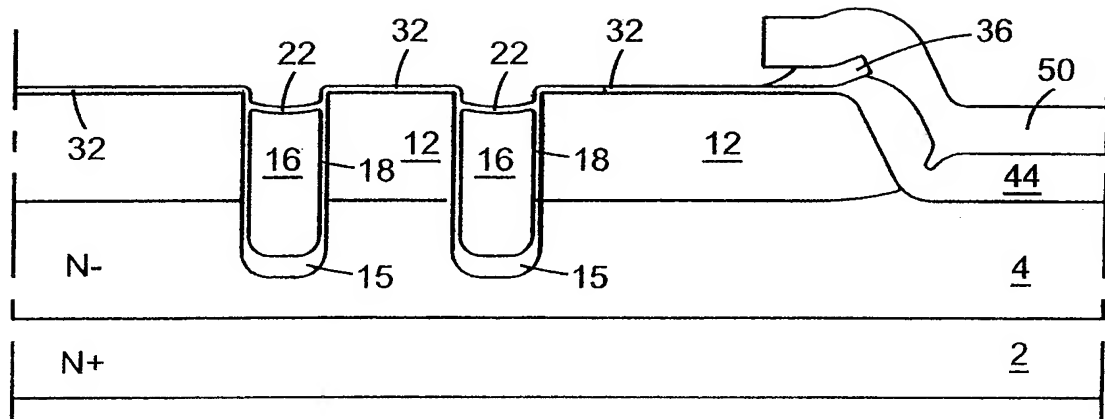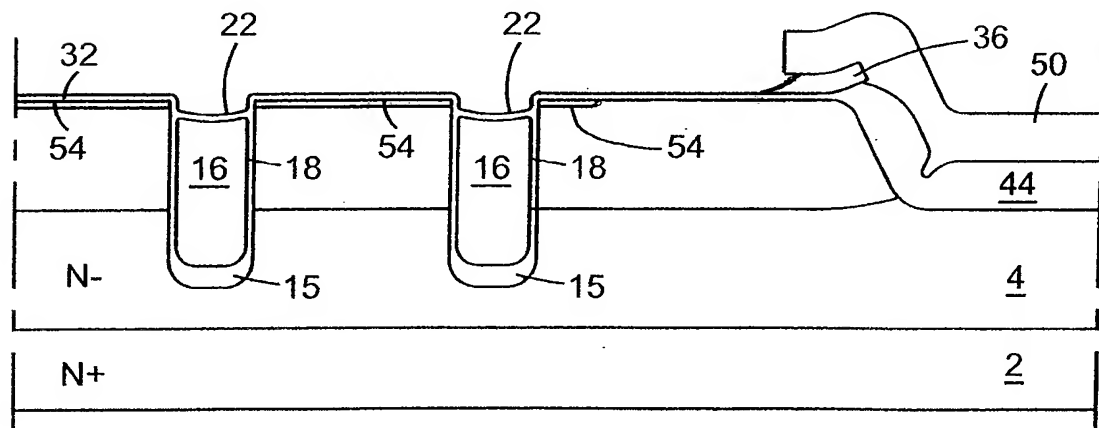
Figure 2q

Figure 2r

Figure 2s

24 22
24 22
26
26
24
50
P+ N+ N+ P+ N+ N+ P+ 12
20 44
18 16 18 16
N- 4
15 15
N+ 2

Figure 2t

28
20 24 22 20 24 22
26
36 24
P+ N+ N+ P+ N+ N+ P+ 50
18 16 18 16 12 44
N- 4
5 15 15
N+ 2
30
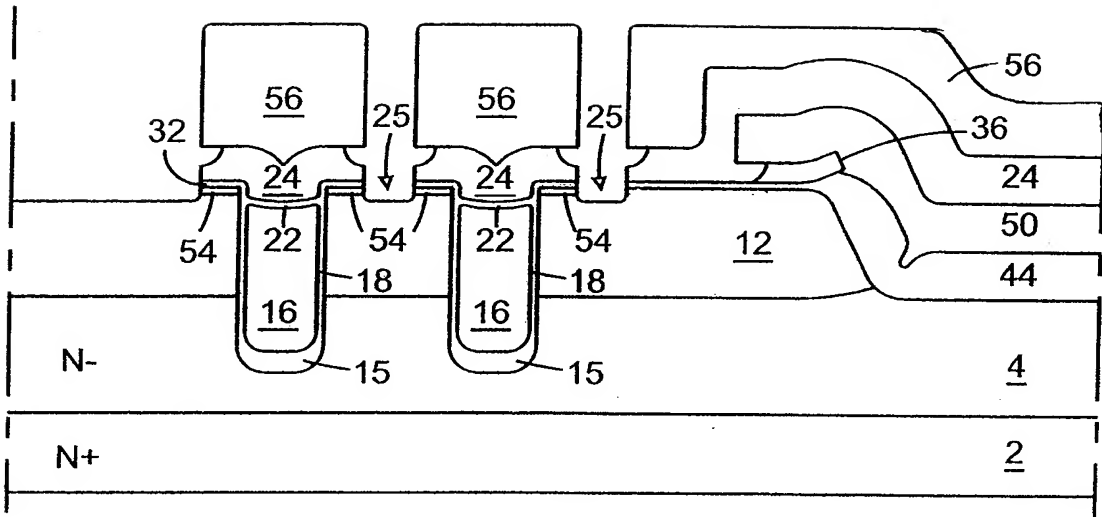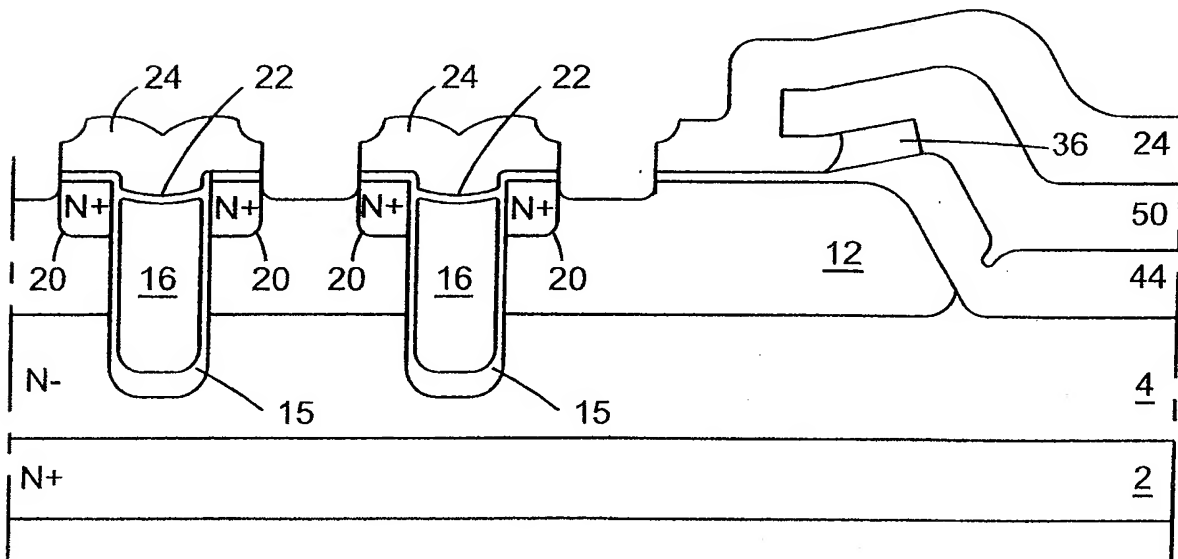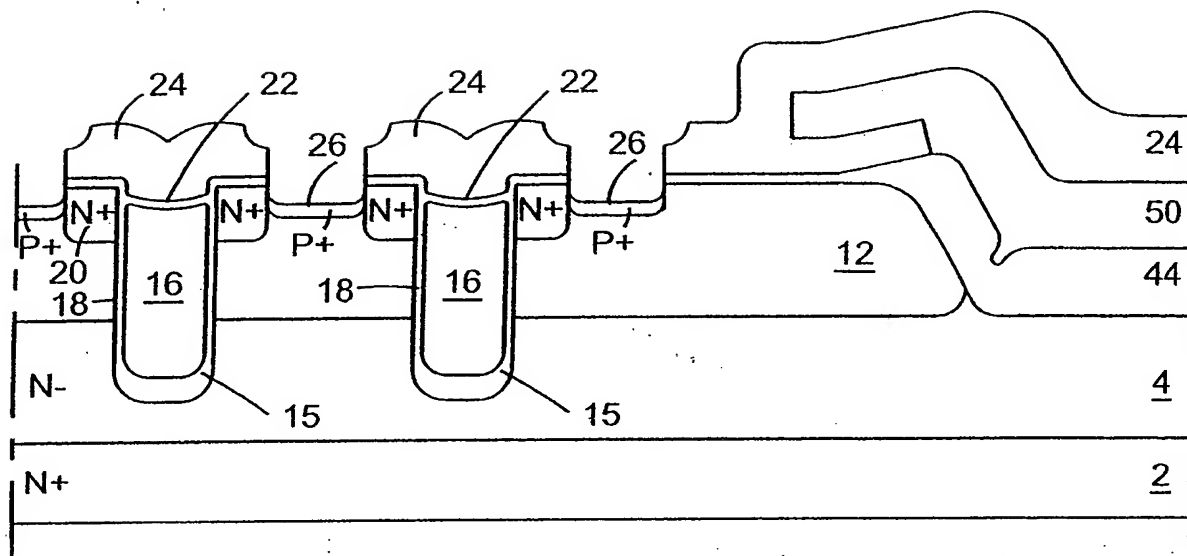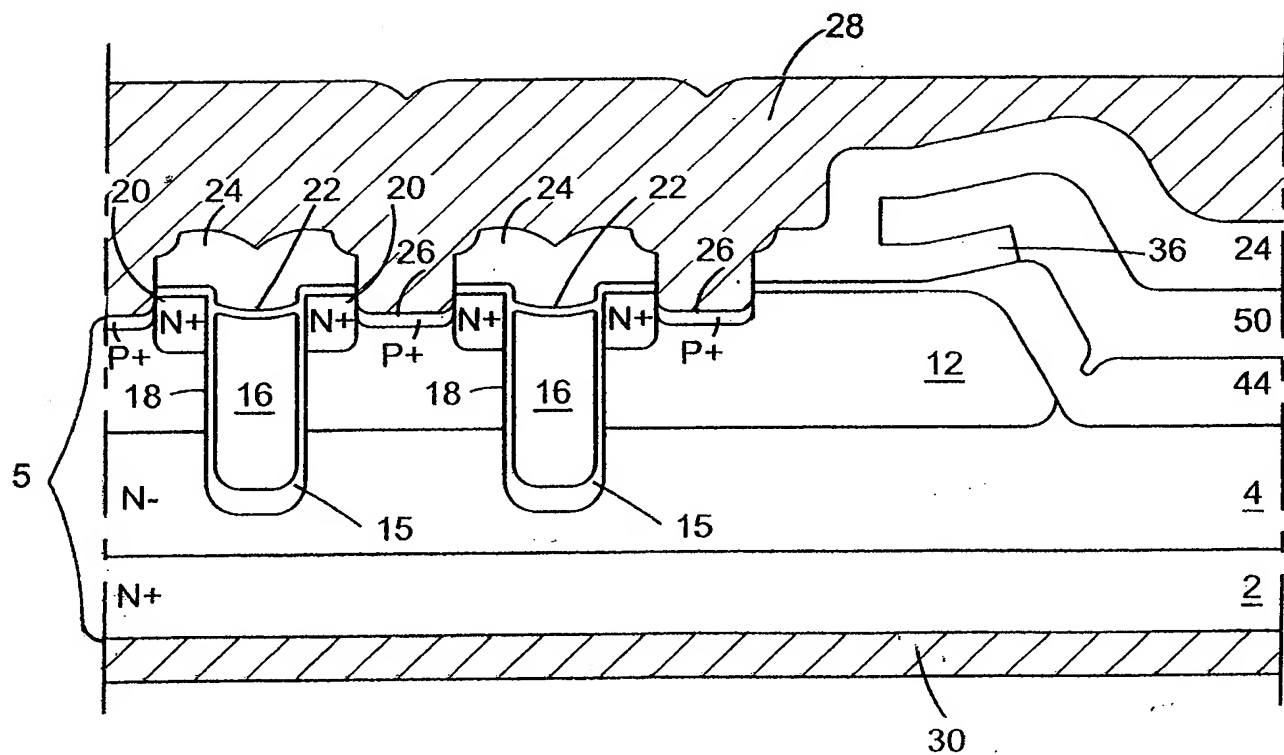
Figure 2u

Figure 3

PRIOR ART

Trench Depth Optimization
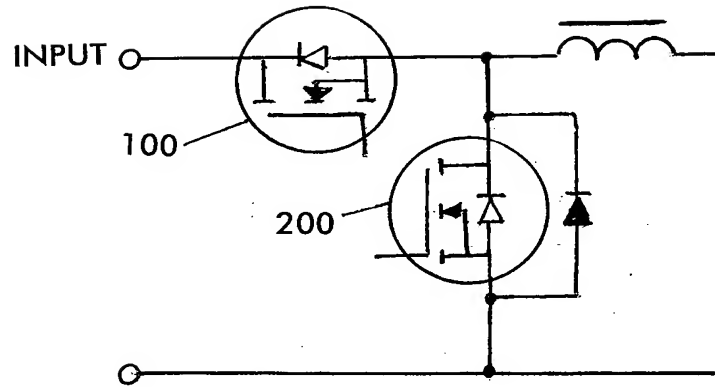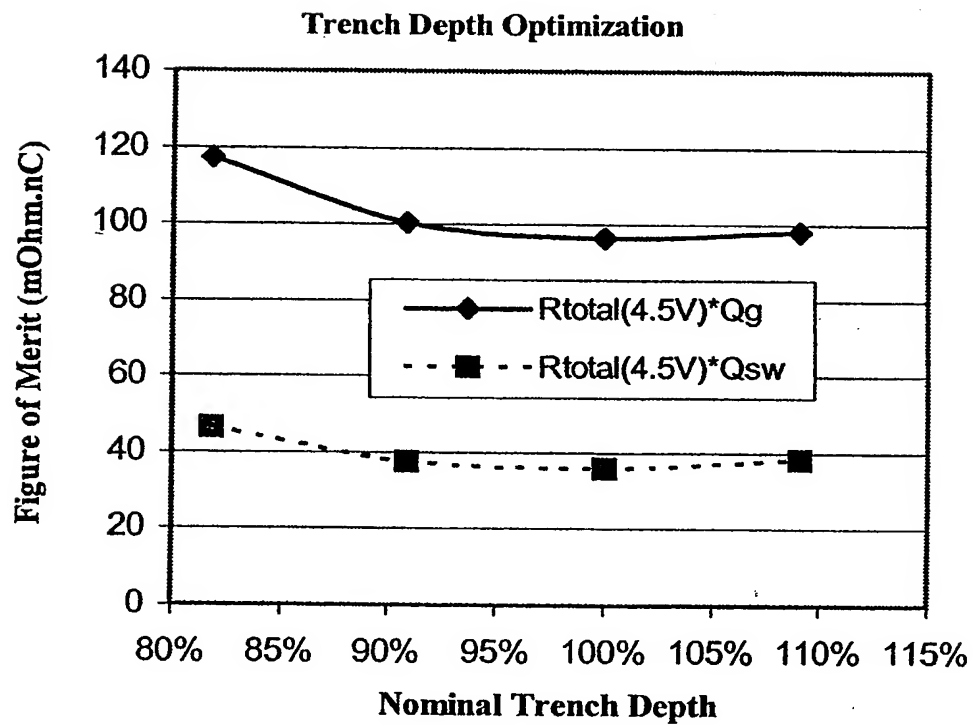
Figure 4 R*Qg as a function of trench depth

Efficiency vs. Load

(12 V in, 1.7 V out, Freq 200kHz)
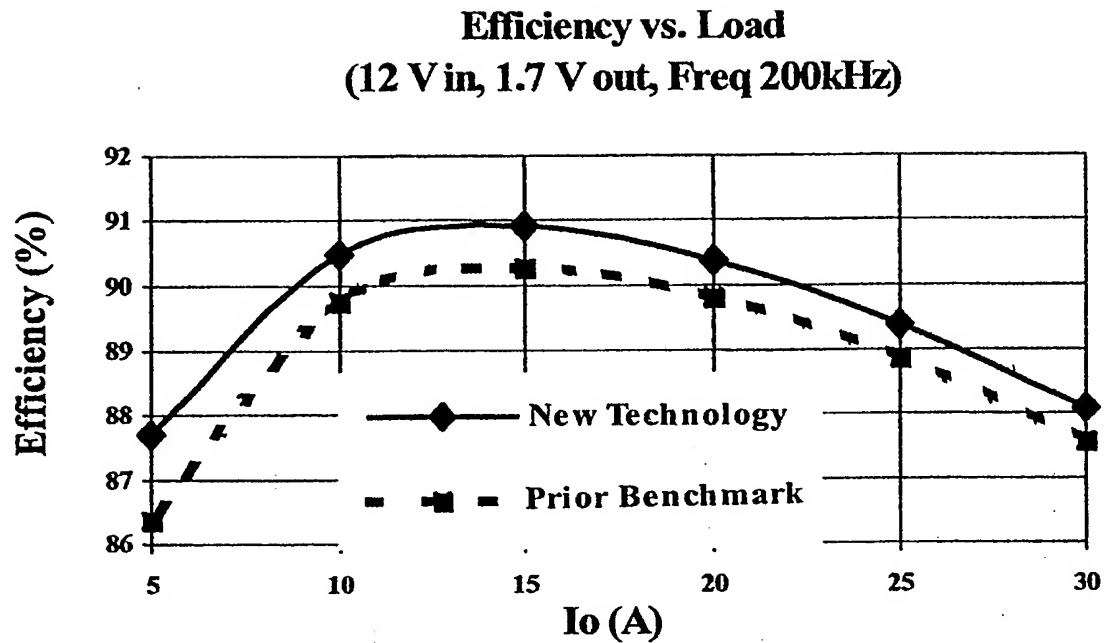
Figure 5a In-circuit efficiency comparison for the
Control FET at 200kHz

Efficiency vs. Load

(12 V in, 1.7 V out, Freq 1Mhz)
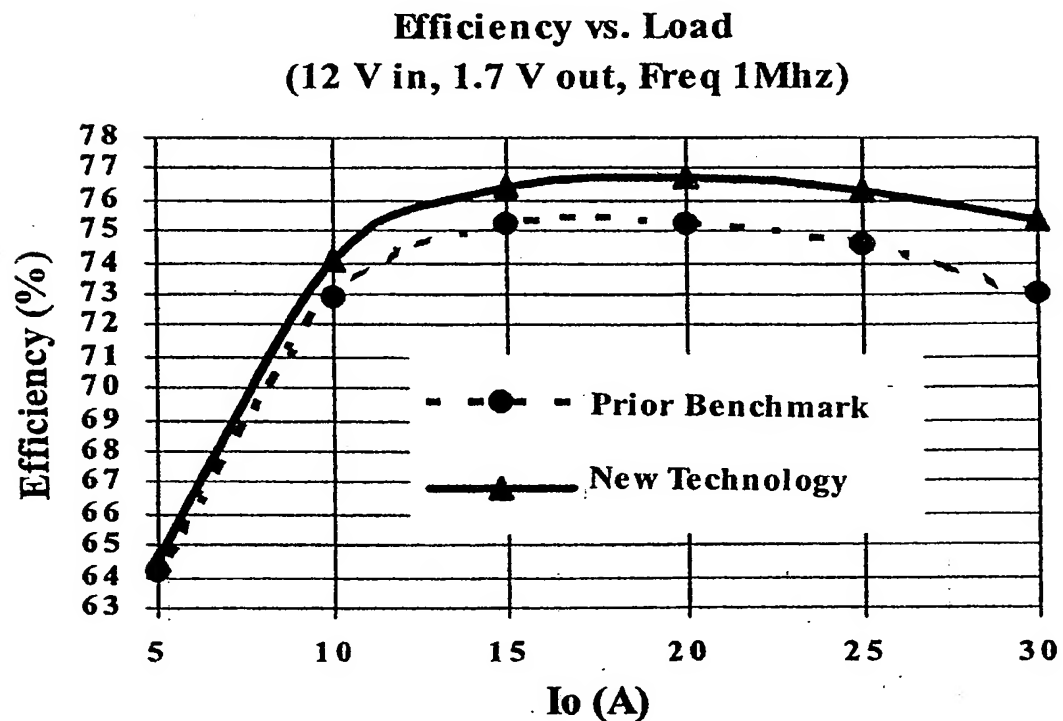
Figure 5b In-circuit efficiency comparison for the
Control FET at 1MHz

Efficiency vs. Load

VRM 12 V in, 1.7 V out 200kHz
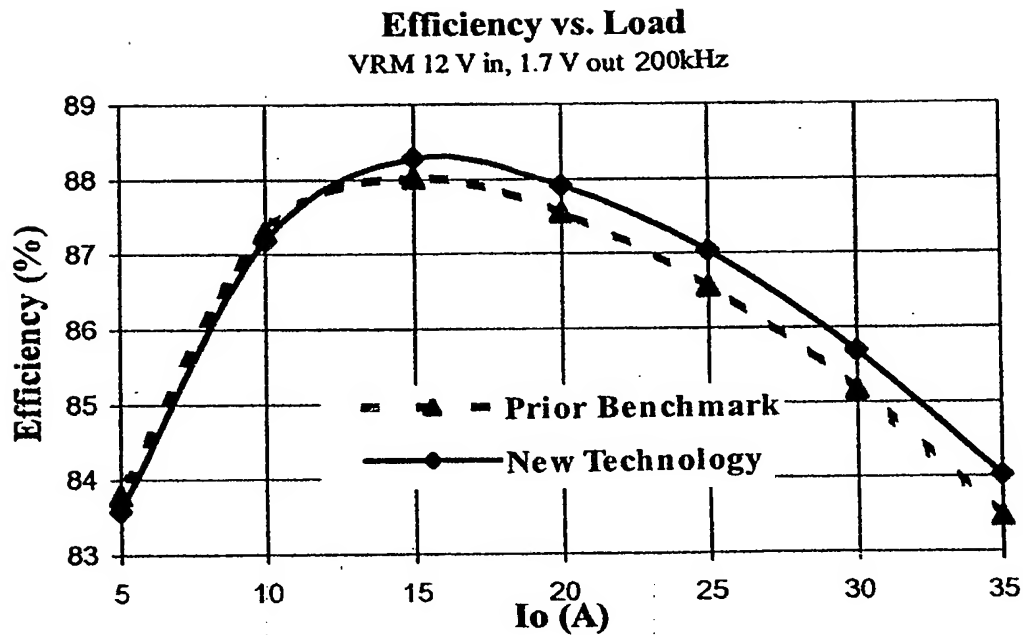
Figure 6a In-circuit efficiency comparison for the Sync
FET at 200kHz

Efficiency vs. Load
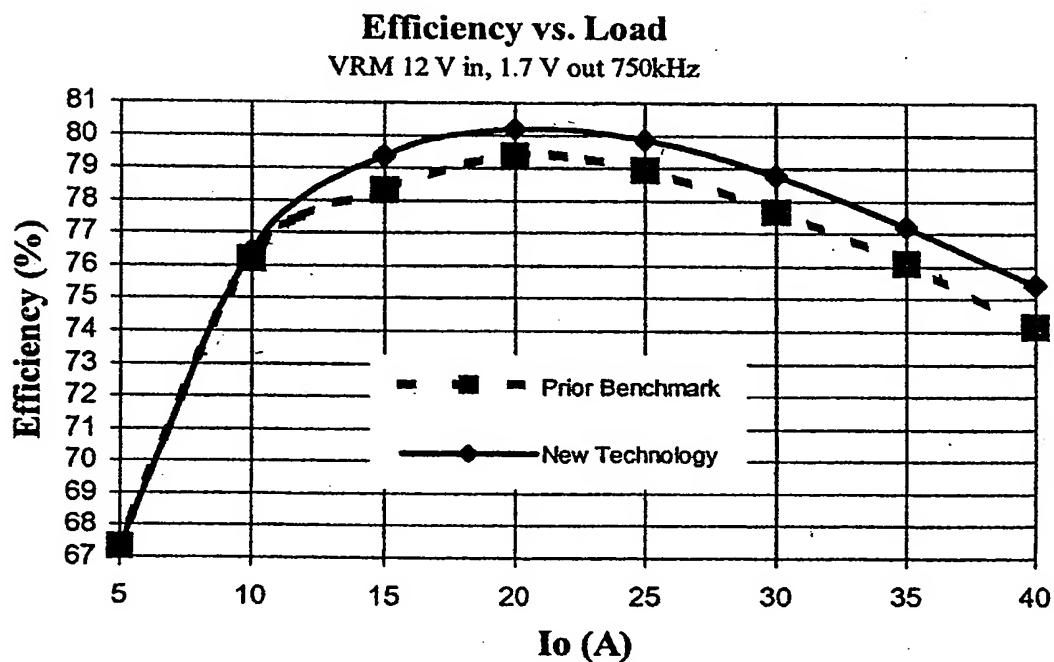
VRM 12 V in, 1.7 V out 750kHz

Figure 6b In-circuit efficiency comparison for the Sync
FET at 750kHz